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INTERNATIONAL SEARCH REPORT

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According	to International Patent Classification (IPC) or to both national class	sification and IPC			
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IPC 7	ocumentation searched (classification system followed by classifi GO6K GO6F				
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	fata base consulted during the international search (name of data	base and, where practical,	eearch terms used)		
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- (74) Agents: HAHN, Peter, K. et al.; Luce, Forward, Hamilton & Scripps LLP, Suite 2600, 600 West Broadway, San Diego, CA 92101 (US).
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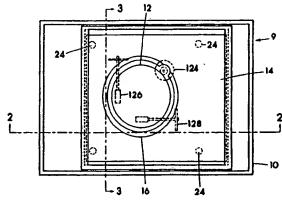
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For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(54) Title: 6 DOF GRAPHIC CONTROLLERS WITH SHEET CONNECTED SENSORS



(57) Abstract: A sensor connecting sheet material for inclusion in appropriately structured multiple-axes controllers comprised of a single input member operable in 6 DOF relative to a reference member of the controller. The input member having return-to-center resiliency relative to the reference member on at least the three perpendicular linear axes. The input member can be of a continuously rotatable trackball-type or a limited rotation joystick-type, and the reference member can be a shaft, a base or a housing. The controllers include carriage structuring for influencing sheet connected sensors by hand-applied operation of the input member. The preferred structures provide cooperative interaction with movement or force influenced sensors in primarily a single area. Some, most, or all of the sensors are preferably supported on a generally single plane, such as on a printed flexible membrane sensor sheet or circuit board sheet. In an alternative embodiment, sensors and conductive traces are applied on a generally flat, flexible membrane sensor sheet, which is then bent into a three dimensional configuration which may in some cases reach a widely-spread 3-D constellation of 6 DOF and/or other sensor mountings. The use of sensors connected by a sheet member, whether finally applied in a flat or 3-D configuration, enables efficient circuit and sensor connection and placement during manufacture, resulting in low product costs and high reliability.



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